DOCUMENT RESUME

ED 108 036 CG 009 849

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TITLE The Effects of Type of Imagery Selection and Multiplicity of Images Covert Positive Reinforcement.
PUB DATE Apr 75
NOTE 12p.; Presented at the Annual Meeting of the American Educational Research Association (Washington, D.C., March 30-April 3, 1975)

EDRS PRICE MF-$0.76 HC-$1.58 PLUS POSTAGE
DESCRIPTORS Behavioral Objectives; *Behavior Change; *Conditioning; Counseling; *Covert Response; *Imagery; *Reinforcement; Research Projects; Speeches
IDENTIFIERS *Reinforcement Survey Schedule

ABSTRACT

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THE EFFECTS OF TYPE OF IMAGERY SELECTION AND MULTIPLICITY OF IMAGES UPON COVERT POSITIVE REINFORCEMENT

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Session #5.11

American Educational Research Association
Annual Meeting
Washington, D.C.
April, 1975

CG009849

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THE EFFECTS OF TYPE OF IMAGERY SELECTION AND MULTIPLICITY OF IMAGES UPON COVERT POSITIVE REINFORCEMENT

Covert conditioning is a relatively new counseling approach which employs unobservable behaviors such as thoughts, images, and feelings to aid a client in controlling maladaptive behavior. Cautela's work in covert conditioning has produced a number of potentially valuable therapeutic methods: covert reinforcement (Cautela, 1970a), covert sensitization (Cautela, 1967), covert negative reinforcement (Cautela, 1970b), and covert extinction (Cautela, 1971a). The covert behaviors in these treatments involve imagination of scenes of possible events which are, depending upon their purpose, either positive, neutral, or aversive. After therapist-controlled training, a client is instructed to emit the practiced covert behavior contingent upon the overt target behavior. Analogous to overt operant conditioning approaches, a positive image will reinforce behavior while an aversive one will punish behavior (Epstein & Peterson, 1973).

Recent investigations have seriously questioned the theoretical explanation of covert positive reinforcement (Ladouceur, 1974; Marshall, Boutilier, & Minnes, 1974). In fact, there have been very few controlled research studies which support the effectiveness of covert positive reinforcement (Wish, Cautela, & Steffen, 1970; Epstein & Peterson, 1973). It is clear that additional data on the effectiveness of covert reinforcement is needed.

In addition, Cautela's (1970a) particular methods of implementing covert reinforcement have never been empirically examined. For instance, although Cautela employs the Reinforcement Survey Schedule (Cautela & Kastenbaum, 1967) to individualize the covert reinforcement, no research has substantiated its superiority over individualization by direct inquiry or over no individualization at all. Also, Cautela (1971b) stresses the importance of deriving multiple positive images for use in covert positive

reinforcement. He believes that satiation will occur when a reinforcer is employed too frequently, but there has been no published evidence to support a satiation effect in covert conditioning. The hypotheses for the present study are:

1. The groups receiving covert positive reinforcement will show significantly greater effects of conditioning than will the control group.
2. The groups who employ the Reinforcement Sutvey Schedule (Cautela & Kastenbaum, 1967) will demonstrate greater conditioning than will the individual-selection group who, in turn, will outperform the groups given standard images.
3. The groups who employ multiple images (three images) will demonstrate greater conditioning than will the groups with a single image.

METHOD

Subjects

Forty-six subjects from the undergraduate humanities course at the University of North Dakota were randomly assigned to one of seven treatment groups. Six were assigned to each of the six covert conditioning treatments, while ten were randomly placed in the control group. Subjects were given credits towards a course requirement for participation. There were twenty-five females and twenty-one males. The average age of the sample was 19.3. Eighty-seven percent were residents of North Dakota, and half had come from hometowns of less than 5,000.

Experimental Setting and Procedure

The one hour experiment was individually administered to each subject. As the subject arrived, s/he was asked to complete several preliminary forms:

a subject consent form, a demographic data sheet, and, depending upon the subject's treatment group, either Reinforcement Survey Schedule or a "self-evaluation" scale designed to take the same amount of time.

The next phase of the experiment took place in a second room. During this phase, the subject was trained to imagine certain positive scenes or, in the control group, to relax when cued by the experimenter. Practicing with the experimenter cue word, "Response," occurred six times for each subject, taking a total of approximately 5 minutes.

In the last phase of the study, subjects were asked to give two sets of thirty numbers between 0 and 100 at fifteen second intervals. The first set of numbers served as a baseline while the second set of numbers generated the dependent variable of the study. During this second set of numbers, covert positive imagery was instituted to reinforce each number ending in 1,2,3,8, or 9. The experimenter followed each response in this category by saying "Response," which cued the subject to imagine the designated positive scene for ten seconds. From this procedure, then, a covariate and a criterion measure were determined: (1) the number of responses in the desired category before covert reinforcement (baseline) and (2) the number of responses in that category during reinforcement.

The ten subjects in the control group were instructed to relax when they heard the experimenter say the word 'Response." They received no instructions to imagine or visualize. Thus, one of the independent variables in the study was the effect of covert reinforcement.

The two remaining independent variables of the study were method of selection and multiplicity of images. The method of selection variable involved three levels: Reinforcement Survey Schedule selection of images, individual selection (similar to "Pick something very pleasant to you."), and standardized selections derived by the experimenters in advance. The

multiplicity dimension involved the two levels of single images vs. multiple images. The positive images selected (or assigned) were abbreviated by a few key words on 3X5 cards. Each subject in an imagery condition had either one (single image) or three (multiple images) cards with cue words to help recall the scene rapidly. Although the cue words for standardized scenes had been prepared in advance, subjects in the other two selection conditions were requested to create their own cues. Subjects in the control group received on 3X5 card with the word "Response" typed on it.

During the practice phase of the experiment, each subject practiced only six times. Thus, a subject in the single image group practiced the same scene six times for ten seconds each time. Subjects in multiple imagery groups practiced each scene only twice.

To control for experimenter bias, the experimenter who helped the client practice the scenes left the room prior to the conditioning portion of the study. The second experimenter sat behind the subject to reduce inadvertent nonverbal cues and was instructed to avoid changes in voice inflection. Also, the second experimenter was blind as to treatment condition of the subject.

RESULTS

Hypothesis one had stated that groups receiving covert positive reinforcement would show significantly greater effects of conditioning than will a no-image control group. Table 1 presents the analysis of covariance relative to this hypothesis. The relationship between the baseline frequencies in the target response class (those numbers ending in 1,2,3,8, or 9) were highly related to the response class frequencies during conditioning ($r=.40$, $p<.01$). However despite the increase in the precision of the test indicated by this relationship between the covariate and the criterion variable, there

was no significant difference between the overall mean of the conditioning groups and that of the control ($F=.13$, $p<.72$).

Insert Table 1 about here

Table 2 contains the results of the analysis of covariance relative to the effectiveness of the imagery selection and multiplicity of imagery. Again, a significant relationship exists between baseline and conditioning target response frequencies ($r=.50$, $p<.01$). No differences are indicated on either the type of selection variable ($F=1.086$, $p<.30$) or on the multiplicity factor ($F=1.609$, $p<.22$). The interaction between these variable was also not significant ($F=2.544$, $p<.10$).

Insert Table 2 about here

DISCUSSION

The lack of significant findings leads the researcher in two possible directions: (1) a questioning of the methodology employed in the study, and (2) a consideration of the validity of the theoretical basis for the study's hypotheses.

A specific examination of the differences in methodology between the two controlled studies supporting covert positive reinforcement (Epstein & Peterson, 1973; Wish, Cautela, & Steffen, 1970) would be valuable. (1) Both of the earlier studies employed slightly more conditioning trials (50 and 36 versus 30). (2) the Epstein and Peterson (1973) research involved a "covert punishment" procedure in addition to the covert reinforcement with each subject. This contrast may have heightened the effect of both individual approaches. (3) Wish, Cautela, and Steffen (1970) employed the word "reinforcement" as a cue for subjects to begin imagery, and thus may have heightened

the treatment effect. (4) Wish et.al. employed a criterion of circle size estimation task whereas both Epstein and Peterson and the present investigation used specific categories of numbers. (5) Wish et.al. did not control for possible experimenter bias as did Epstein and Peterson and the present study by using experimenters blind as to the treatment condition of subjects. Each of these methodological differences might have effected the outcomes of these studies, and it is clear that further research is needed.

The second possible direction to follow in reacting to nonsignificant findings is one of questioning the theoretical foundations of the study. The results, here, call into question Cautela's assumptions. As had the previously cited investigations (Ladouceur, 1974; Marshall, Boutilier, & Minnes, 1974), this research tends to cast doubt on the covert conditioning phenomenon. The methodology employed was essentially the same as Epstein and Peterson's (1973) successful demonstration of differential covert conditioning. Thus, despite a carefully-executed study in which subjects practiced their positive covert imagery and, as well as one can tell, delivered these images contingent upon the desired response category, no effect was found for the covert positive reinforcement treatment. Additionally, neither of Cautela's assumptions relative to the importance of individualization or to the necessity of multiple reinforcers received support. (Although, since no conditioning effect was found, one might logically expect no effects for these subhypotheses.)

As with all therapeutic procedures, Cautela's ideas should be validated by empirical as well as theoretical and clinical evidence. This study has indicated a need for further work in this area.

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TABLE 1

ANALYSIS OF COVARIANCE* FOR DIFFERENCE BETWEEN COVERT CONDITIONING GROUPS AND A NO-IMAGERY CONTROL ON FREQUENCIES IN TARGET RESPONSE CLASS

Source of Variation	df	$df_{adj.}$	$SS_{adj.}$	$MS_{adj.}$	F
Between	1	1	1.150	1.160	.13
Within	44	43	388.894	9.044	

*F Value of test of no association between baseline and conditioning frequencies= 8.0387, df=1,43,p<.007.

TABLE 2

ANALYSIS OF COVARIANCE* FOR THE EFFECTS OF IMAGERY SELECTION AND MULTIPLICITY OF IMAGERY UPON COVERT CONDITIONING OF THE TARGET RESPONSE CLASS

Source of Variation	df	$df_{adj.}$	$SS_{adj.}$	$MS_{adj.}$	F
Imagery Selection Procedure (S)	2	2	15.808	7.904	1.086
Multiplicity of Imagery (M)	1	1	11.704	11.704	1.609
S X M	2	2	37.018	18.509	2.544**
Error	30	29	210.946	7.274	

*F Value of test of no association between baseline and conditioning frequencies= 9.674, df=1,29 p<.004.

**p .10